

FLIGHT BEHAVIOR AND DISPERSAL OF DIAPREPES ABBREVIATUS

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Abstract

From July to October 1975, marked adult *Diaprepes abbreviatus* (L.) (Coleoptera: Curculionidae) were released in an isolated grove near Apopka (Orange County), Florida. Specimens were recovered for 50-52 days following each of two releases. Multiple sightings were made of 42% of the released females and 34% of individually coded males. Nearly 80% of the sightings were made within five days of release.

An exotic curculionid, the so-called sugarcane rootsalk borer weevil,

¹Coleoptera: Curculionidae. First published in *Florida Entomologist*, Vol. 61:89-91.

A REPLY

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needs and their ingenuity in adding a new lucrative component to their product line. The CMBI's letter, unfortunately, put much emphasis on semantics and the use of data and only coincidentally did they mention the core of the problem. Nevertheless, the CMBI did in fact recognize its failure and in the early 1970s began to encourage the Israeli growers to plant soft fruit varieties. Why was there a 20-year delay?

In another part of his article in Ha'aretz, Mr. Zvi wrote: "Those in charge of the agricultural sector recognize that the citrus industry has at least a 30-year lag in choice of varieties."⁵

⁵Mordechai Zvi, Ha'aretz, July 24, 1978, Tel-Aviv, Israel.

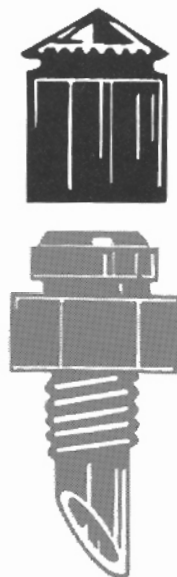


Diaprepes abbreviatus (L.) (Fig. 1), was first found infesting citrus near Apopka (Orange County), Florida, in 1964. The original quarantine area of ca. 2,000 ha established in 1968 has been extended three times to encompass ca. 13,350 ha by 1975 (Woodruff 1968, Selhime and Beavers 1972). In 1975, an infested area was found near Forest City (Seminole

County), Florida, ca. 14 km from the Orange County area, and an additional 2,400 ha were placed under quarantine.

Because the two quarantined areas are separated by a considerable distance and infested groves within the quarantine areas are not necessarily contiguous, flight behavior and dispersal of *D. abbreviatus* were studied. This information would be helpful in establishing management

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BEHAVIOR

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control programs for this relative-
 new pest.

METHODS AND MATERIALS

Two tests were conducted near
 opka, Florida, in an isolated 20-ha
 grove of 'Hamlin' oranges; the grove
 consisted of ca. 2,000 three to four-m
 trees in a 7.6 x 7.6 m planting. No

chemical treatments had been applied
 there since 1969. Adult *D. abbreviatus*
 were field-collected and coded with
 enamel paints (Cross and Mitchell
 1964) one or two days before each of
 the two releases were made on calm
 days (wind speed less than 1.6 km/h)
 in July and October 1975. Adult
 weevils were placed on top of a 0.3-m-
 high cardboard box in the center of a
 row (same site for each release).

On each release date we observed

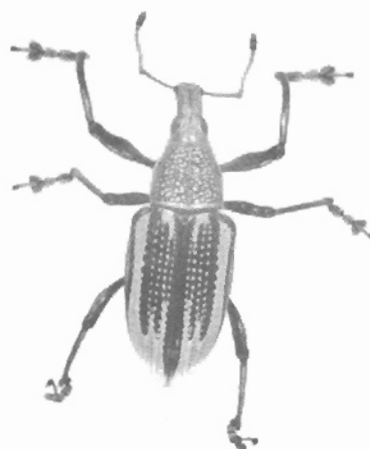


Figure 1. Sugarcane rootstalk borer weevil, *Diaprepes abbreviatus* (L.)

the flights and measured distances
 flown from the release site for as many
 weevils as possible. Visual searches
 of the trunks and lower canopies of at
 least 50-150 trees around the release
 site were made at various intervals
 during the eight weeks following each
 study. The entire grove was examined
 weekly for the marked weevils.

Test I. Fifty males and 50 females,
 each individually color-coded, were
 released July 14 to determine
 distances flown by adult weevils dur-
 ing a period when little or no new
 growth (the preferred food source for
 the adults) was present. The release
 coincided also with the period when
 the weevil population generally begins
 to increase (Beavers and Selhime
 1976). First observations were made
 four hours after release. Subsequent
 observations were made daily during
 the first week, three times in the

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BEHAVIOR

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second week, and once per week until Sept. 3. Individual adults were identified by color code and then replaced on the tree.

Test II. Sixty-one males and 61 females were released Aug. 8 to determine adult weevil flight distances during a period when considerable new foliage was present. These adults were marked with enamel paints so that sex could be determined without disturbing the adults; i.e., a single spot on males' elytra and two spots on the elytra for females. Observations began five days after the release. Data were recorded at weekly intervals for the first five weeks and at two-five-day intervals for the last three weeks of observations.

RESULTS AND DISCUSSIONS

Test I. A total of 82 sightings was made during the 50 days following the July release (Table 1). Many individuals in the original group of 100 were recovered more than once; 21 females accounted for 43 observations (Table 1), and 17 males produced 30 observations. Data from these individuals were not extensive enough to demonstrate a sexual difference in dispersal distances

TABLE 1. Flight Distances of Marked Adult *Diatrepe abbreviatus* Released in an Isolated Citrus Grove Near Apopka, Florida.

Days after release (date)	No. adults observed		Distance (m) from release site	
	Females	Males	Minimum	Maximum
0-2 (14 July)	12	14	3	31
1 (15 July)	9	9	3	18
2 (16 July)	4	6	3	23
4 (18 July)	6	4	3	26
7-10 (21-30 July)	11	3	11	236
30-50 (11 Aug.-3 Sept.)	1	5	18	228
TEST II. Release date: 8 August 1975. Sixty-one male and 61 female adults color-coded by sex only.				
5-27 (13 Aug.-4 Sept.)	4	7	11	148
31-52 (9-30 Sept.)	8	4	18	208

through time. Some individuals (Male "8", Female "6") consistently stayed close, within nine m to the release site, while others flew either greater distances (Female "18" at 99 m) after 30 days or changed locations more frequently (Male "11" at 3 m after 4 h, 18 m at 2 days, 236 m at 9 days and 228 m at 50 days). The numbers of adults sighted decreased markedly by 16 days after the release (Table 1).

Test II. The adults used in Test II were coded only for sex. Observations could be made without disturbing the adults, although use of this method meant that the movement of individual weevils could not be followed. Since observations were not begun until five days after release, the bulk of weevil dispersal activity may have

occurred in the interim period. The numbers of individuals observed and the flight distances observed are in accord with those observed over comparable time intervals in the July release.

In dispersing from the release site, most of the adult weevils took flight immediately, although some first crawled a short distance away from the box. Before flight, the posterior of the abdomen was lowered, the elytra were elevated, and the flight wings were fully extended. Most weevils flew directly to the nearest tree from the release site or landed on weeds around the tree canopy. Those flying longer distances (38-45 m) flew to ca. twice the tree height and appeared to hover a few seconds before landing.

When disturbed, some adults feigned death by dropping to the ground and remaining motionless; others hid in the trash on the ground. Still others dropped off the leaves and took flight before hitting the ground. They usually landed on the first weeds or tree branches contacted.

From our limited field observations, *D. abbreviatus* is capable of strong flight of short duration and

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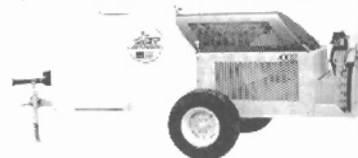
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The 91st annual meeting of the Florida State Horticultural Society will be held Nov. 7-10 at the Carillon Hotel in Miami Beach, with the annual banquet scheduled for Nov. 9 at 10 p. m.

The general session will be held 9 a. m., Nov. 8, with President R. Reed of Tampa presiding over a symposium "On Cold Weather."

Section meetings will be held that afternoon and both morning and afternoon Nov. 9, with 20 minutes allotted for the presentation of each paper.

Meeting places for the sections will be: citrus, Royal Palm room; garden and landscape, Hibiscus room; handling and processing, Coconut Palm room; Krome Memorial Institute, the Oak room; ornamental, Cypress room; vegetable, Banyan room.

BEHAVIOR

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distance. Once they have landed, they apparently will remain in one place for long periods unless disturbed. Although the releases were made on calm days, wind could also be a vital factor affecting the distance



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by: (1) our observations on the locations of weevil-infested groves within a quarantine area; (2) the distance separating the two quarantine areas; (3) finding immatures in the soil of plants shipped to other areas; and (4) finding adults clinging to tractors used in infested groves.

Acknowledgment

We thank W. McCloud of this laboratory and R. Tubb, Florida Division of Plant Industry, for assist-

Woodruff, R. E. 1964. A Puerto Rican weevil new to the United States (Coleoptera: Curculionidae). Fla. Dep. Agr. Ent. Circ. 30:1-2.

Woodruff, R. E. 1968. The present status of a West Indian weevil *Diaprepes abbreviatus* (L.) in Florida (Coleoptera: Curculionidae). Fla. Dep. Agr. Ent. Circ. 77:1-4.



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